

Removal Action Report for 2 Mobile Offices in the 100-K Area at the U.S. Department of Energy's Hanford Site

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management



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Removal Action Report for 2 Mobile Offices in the 100-K Area at the U.S. Department of Energy's Hanford Site

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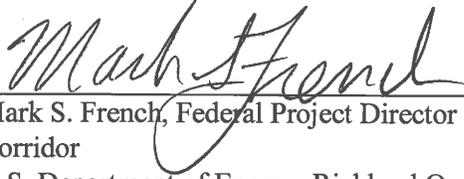
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Signature page for the *Removal Action Report for 2 Mobile Offices (MO-293 & MO-442) in the 100-K Area* at the U.S. Department of Energy's Hanford Site.



Mark S. French, Federal Project Director for the River
Corridor
U.S. Department of Energy, Richland Operations Office

3/16/16

Date

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Executive Summary

This Removal Action Report summarizes the completion of deactivation, decommissioning, decontamination, and demolition (D4) activities associated with 2 mobile offices in the 100-K Area: MO-293 and MO-442. The D4 activities were conducted by the U.S. Department of Energy under a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* response action in accordance with the *Action Memorandum for the Non-Time-Critical Removal Action for the 105-KE and 105-KW Reactor Facilities and Ancillary Facilities* ([Action Memorandum] EPA, 2007) and *Removal Action Work Plan for 105-KE/105-KW Reactor Facilities and Ancillary Facilities* (DOE/RL-2005-26).

These 2 mobile offices were used by engineering, administration, management, and craft to support operations, maintenance, and cleanup activities within the 100-K Area. Radiological work activities were not performed at or within the mobile offices; however, radiological surveys were performed to confirm radiological contamination was not present as a result of transport from biological vectors (e.g., birds and rodents). The D4 of the mobile offices concluded with disposal of the debris and waste to the Environmental Restoration and Disposal Facility or Basin Disposal. The D4 activities occurred in November 2014.

The completion of this removal action mitigates the potential threat of release of contaminants to the environment, and is consistent with the remedial actions for the 100-KR-1 and 100-KR-2 Operable Units, identified in the Action Memorandum (EPA, 2007). The D4 activities for MO-293 and MO-442 were Base-Funded.

Contents

1	Introduction	9
	1.1 Site Description	9
	1.2 Regulatory and Enforcement History	9
	1.3 Environmental Setting	11
2	Site Background for Two Mobile Offices	11
	2.1 Building Description and Background	11
	2.2 Contaminant Identification	11
	2.3 Description of the Removal Action	12
	2.3.1 Removal Action Objectives.....	12
	2.3.2 Exposure and Land Use Assumptions.....	12
	2.3.3 Design Summary	12
	2.4 ROD Amendments, Significant Differences, or Waivers.....	12
3	Removal Action Summary	13
	3.1 Summary of Activities.....	13
	3.2 Verification Activities	15
	3.2.1 Radiological Surveys.....	15
	3.2.2 Sampling and Analysis.....	15
4	Performance Standards and Quality Control.....	15
	4.1 Attainment of Performance Standards.....	16
	4.1.1 Performance Completion Criteria	16
	4.1.2 Removal Action Objectives Verification	18
	4.1.3 Statement of Protectiveness.....	19
	4.2 Construction Quality Assurance/Quality Control.....	19
	4.3 Cleanup Verification Quality Assurance/Quality Control.....	19
	4.3.1 Data Quality Assessment	20
	4.3.2 Environmental Quality Assurance.....	20
	4.4 Regulatory Oversight.....	20
5	Final Inspection and Certifications.....	20
6	Operation and Maintenance Activities	20
7	Summary of Project Costs	20
8	Observations and Lessons Learned	20
9	Contact Information.....	21
10	References	21
11		

Figures

Figure 1. Former Locations of 2 Mobile Offices in the 100-K Area.....	10
Figure 2. MO-293 and MO-442 Prior to Removal Action.....	5
Figure 3. MO-293 and MO-442 Areas After Removal Action	6
Figure 4. Last Section of MO-293 Leaving the 100 K Area	7

Tables

Table A. Summary of Characterization Surveys at MO-293 and MO-442	
Table 1. Completion Criteria for the 100-K Area Mobile Offices Demolition.....	8
Table 2. Cost Summary.....	20

Terms

ACM	asbestos-contaminated material
ARAR	applicable or relevant and appropriate requirements
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
D4	deactivation, decommissioning, decontamination, and demolition
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
KE	K East
KW	K West
N/A	not applicable
NPL	National Priorities List
OU	operable unit
PCB	polychlorinated biphenyl
RAWP	removal action work plan
RAO	removal action objective
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
ROD	Record of Decision
Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
UHCM	unquantified hazardous construction materials

1 Introduction

This report documents completion of a removal action conducted by the U.S. Department of Energy (DOE) for 2 mobile offices in the 100-K Area: MO-293 & MO-442. This work was performed in accordance with the *Action Memorandum for the Non-Time-Critical Removal Action for the 105-KE and 105-KW Reactor Facilities and Ancillary Facilities* ([Action Memorandum] EPA, 2007) and the *Removal Action Work Plan for 105-KE/105-KW Reactor Facilities and Ancillary Facilities* ([RAWP] DOE/RL-2005-26).

1.1 Site Description

The 2 mobile offices, shown in Figure 1, were located in the 100-K Area of the Hanford Site, which is a DOE site in south-central Washington State, occupying 586 mi² of the Columbia River Basin. The Hanford Site's mission from the early 1940s to approximately 1989 included defense-related nuclear research, development, and weapons production activities. These activities created a wide variety of chemical and radioactive wastes. The current Hanford Site mission is focused on the cleanup and/or management of those wastes and long-term stewardship of the site.

1.2 Regulatory and Enforcement History

The *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) was enacted to enable the federal government to conduct cleanup of hazardous substances released into the environment. In 1986, CERCLA was amended by the *Superfund Amendments and Reauthorization Act of 1986*, which included Section 120 (42 USC 9620, "Federal Facilities"), developed specifically for federal facility cleanup. Presidential Executive Order 12580, *Superfund Implementation*, delegated to DOE the primary authority to conduct removal and remedial actions under authority of CERCLA Section 104, "Response Authorities." In 1987, the federal government determined that waste that included a mixture of radioactive and hazardous chemical components was subject to regulation under the *Resource Conservation and Recovery Act of 1976* (RCRA) and its Washington State counterpart. In 1989, DOE, the U.S. Environmental Protection Agency (EPA), and Washington State Department of Ecology (Ecology) signed the *Hanford Federal Facility Agreement and Consent Order* ([Tri-Party Agreement] Ecology et al., 1989). The Tri-Party Agreement (Ecology et al., 1989) implemented DOE's exercise of CERCLA remedial action authority under EPA oversight, in accordance with CERCLA Section 120, and also included an Ecology Consent Order containing a schedule for bringing all current Hanford Site hazardous waste operations into compliance with RCRA under the new mixed waste requirements. DOE's authority to conduct removal actions under CERCLA Section 104 is independent of the Tri-Party Agreement (Ecology et al., 1989), but is exercised cooperatively with the respective oversight authorities of EPA and Ecology.

During this time frame, portions of the Hanford Site were proposed for inclusion on the National Priorities List ([NPL] 53 FR 23988, "National Priorities List for Uncontrolled Hazardous Waste Sites - Update 7"). EPA placed the 100, 200, 300, and 1100 Areas on the NPL on November 3, 1989 (54 FR 41015, "National Priorities List for Uncontrolled Hazardous Waste Sites – Final Rule 10/04/89"). These areas were then further divided into operable units (OUs). The 100 Area is located along the southern banks of the Columbia River in the northern part of the Hanford Site and encompasses an area of approximately 26 mi². The 100-K Area is located within the 100 Area of the Hanford Site.

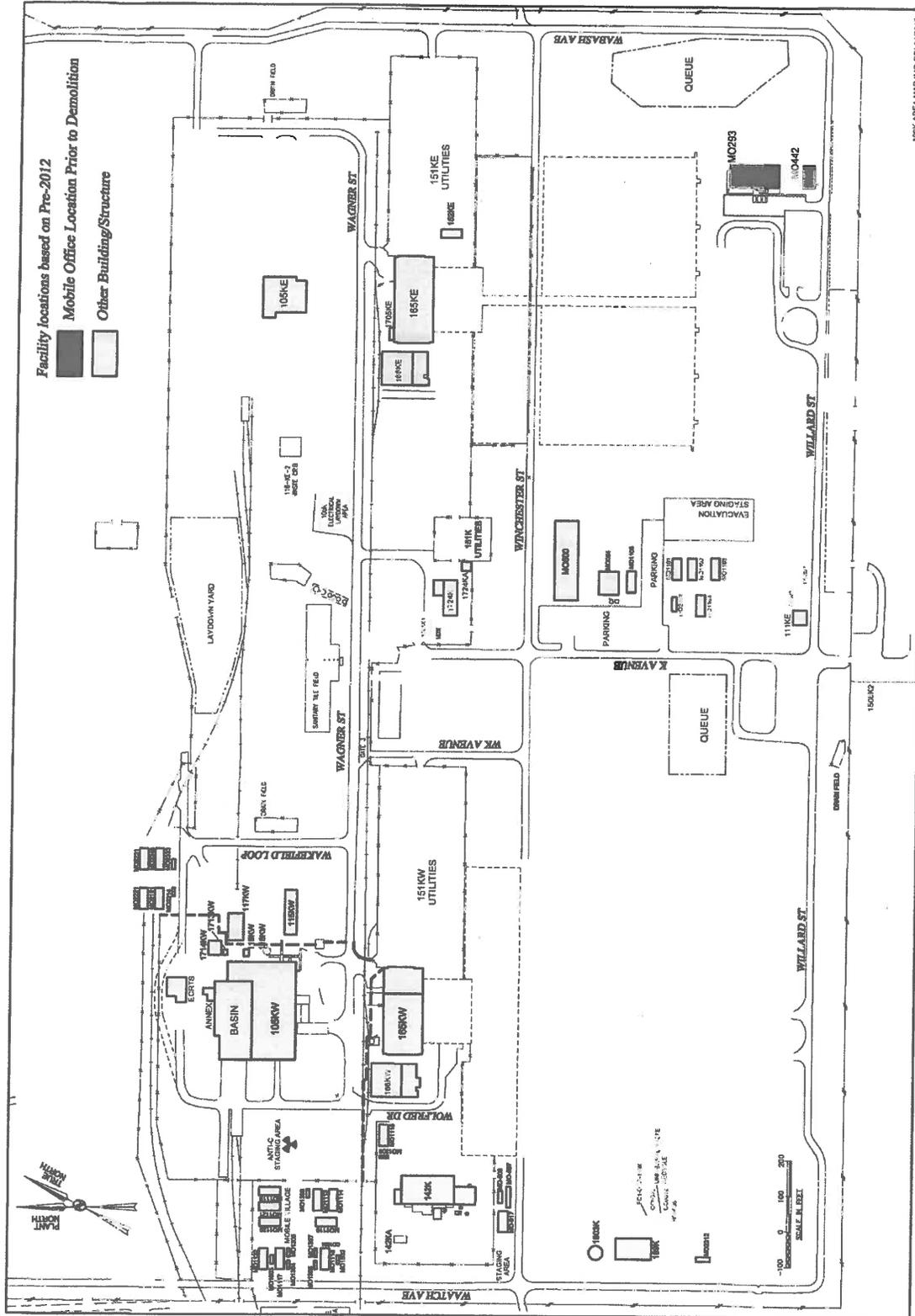


Figure 1. Former Locations of 2 Mobile Offices in the 100-K Area

In 2004, alternatives for conducting a non-time-critical removal action for the 105-K East (KE) and 105-K West (KW) Reactor Buildings and remaining ancillary facilities were evaluated in the *Engineering Evaluation/Cost Analysis for the 105-KE and 105-KW Reactor Facilities and Ancillary Facilities* ([EE/CA] DOE/RL-2005-86). The EE/CA (DOE/RL-2005-86) recommended deactivation, decommissioning, decontamination, and demolition (D4), which was the selected alternative in the Action Memorandum (EPA, 2007) for the mobile offices.

In 2007, the RAWP (DOE/RL-2005-26) was issued to support removal actions resulting from the Action Memorandum. The RAWP applies to the 105-KE and 105-KW Reactor Buildings and all ancillary facilities in the 100-K Area. The RAWP specifically listed the 2 mobile offices described in this report.

1.3 Environmental Setting

The 100-K Area of the Hanford Site is located on the river corridor area of the Columbia River. Most of the area within the 100-K boundary is highly disturbed, with substrate consisting primarily of compacted gravel. Vegetation consists primarily of widely scattered weedy species, with most of the areas having essentially no vegetation. The 2 mobile offices were located approximately 3,200 ft from the Columbia River, and groundwater at these locations is at a depth of approximately 121 ft below ground surface.

2 Site Background for Two Mobile Offices

2.1 Building Description and Background

The two mobile offices were located in the southeast corner of the 100K area and were used by engineering, administration, management, and craft to support operations, maintenance, and cleanup activities within the 100-K Area. MO-293 was in use from 2001 to 2009. It was a 10-wide trailer with a footprint of 66 feet by 140 feet (9240 square feet). MO-442 was in use from 1998 through 2009. It was a double wide trailer with a footprint of 28 feet by 66 feet (1848 square feet).

2.2 Contaminant Identification

The contaminants identified in the Action Memorandum (EPA, 2007) for the mobile offices included the potential presence of radioactive contamination (i.e., as a result of biological transport from birds and rodents) and unquantified hazardous construction materials (UHCM). The waste planning checklists prepared during D4 identified the presence of mercury thermostats, lead batteries, refrigerants, oils, and a tritium exit sign. Surveys for beryllium, asbestos, and radiological contamination were completed prior to disposal. Table A provides characterization information

Table A. Summary of Characterization Surveys at MO-293 and MO-442

Type	Date	Documented in	Results Summary
Asbestos	April 9, 2014	Survey IDs-14-20929 and 14-20930	No asbestos containing materials identified during inspection
Radiological Surveys	March 18, 2014 March 21, 2014	RSR No. L-1400284 RSR No. L-1400301	No contamination identified
IH Surveys and Beryllium Characterization	September 3, 2015	Beryllium Sampling reports for samples 14-20750 - 001-016, 14-20751 - 001-016 and 14-20752 001-004- in http://prcsp.rl.gov/shsq/osih/Beryllium_Documents/MO293-BVR.pdf and http://prcsp.rl.gov/shsq/osih/Beryllium_Documents/MO442-BVR.pdf	Established MO-293 and MO-442 as Be Clean

2.3 Description of the Removal Action

The purpose of this removal action was to mitigate the threat of release of contaminants from the 100-K Area ancillary facilities to the environment, and to be consistent with remedial actions for the 100-KR-1 and 100-KR-2 OUs. The Action Memorandum (EPA, 2007) and the approved RAWP (DOE/RL-2005-26) specify D4 for the mobile offices. Removal Action Objectives

The following removal action objectives (RAOs) were identified in the approved RAWP (DOE/RL-2005-26):

- Protect human receptors from exposure to contaminants above acceptable exposure levels within facility structures
- Control the migration of contaminants from the facilities into the environment
- Facilitate and, to the extent practicable, be consistent with anticipated remedial actions within the 100-K Area OUs
- Prevent adverse impacts to cultural resources and nesting migratory birds
- Achieve applicable or relevant and appropriate requirements (ARARs) to the fullest extent practicable
- Safely treat, as appropriate, and dispose of waste streams generated by the removal action
- Take no action that will preclude the eventual final disposition of the 105-KE and 105-KW Reactor blocks

The completion criteria by which the RAOs were achieved for this removal action are documented in Section 5.

2.3.1 Exposure and Land Use Assumptions

Cleanup activities at the 100-K Area are conducted to achieve compliance with a rural-residential exposure scenario, as stipulated in the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (100 Area Remaining Sites Record of Decision [ROD]; EPA/ROD/R10-99/039).

2.3.2 Design Summary

This removal action was completed following the provisions in the approved RAWP (DOE/RL-2005-26). The following were the primary steps:

- Conduct D4 activities for 2 mobile offices
- Characterize, package, and dispose the waste to the Environmental Restoration Disposal Facility (ERDF).
- Conduct radiological surveys as necessary to aid in final characterization for site closeout

2.4 ROD Amendments, Significant Differences, or Waivers

No ROD amendments, significant differences, or waivers apply to this removal action.

3 Removal Action Summary

3.1 Summary of Activities

Pre-demolition planning activities were performed for each of the 2 mobile offices and consisted of walk downs to identify all utility interfaces (e.g., electrical, water, sewer, etc.) and characterization activities to identify all potential hazardous substances (e.g., UHCM, mercury thermostats, lead batteries, ACM, etc.) requiring disposition prior to or during demolition. Surveys for beryllium, asbestos, and radiological contamination were completed prior to disposal.

The mobile offices were rendered cold and dark through isolation of all electrical and communication lines. Fire and sanitary water lines were cut and capped approximately 12-in. below grade. The septic tank associated with MO-293 and MO-442 was pumped and left in place for remediation under a separate CERCLA remedial action. (That septic tank was waste site 100-K-50 which has been dug up and sampled for clean closure.)

No foundations were associated with the two mobile offices. The offices were set on gravel surfaces; the concrete pads and asphalt surfaces were left in place after demolition as they are not subject to the removal action. After completion of pre-demolition activities, the mobile offices were transported intact to ERDF where they were demolished and disposed. The D4 of the mobile offices was performed between July 2014 and November 2014. Waste characterization and D4 debris/waste load-out activities were conducted in accordance with the waste management ARARs identified in the Action Memorandum (EPA, 2007), the RAWP (DOE/RL-2005-26) and the ERDF acceptance criteria. Figures 2 and 3 show the area of the mobile offices prior to and after completion of the D4 activities.

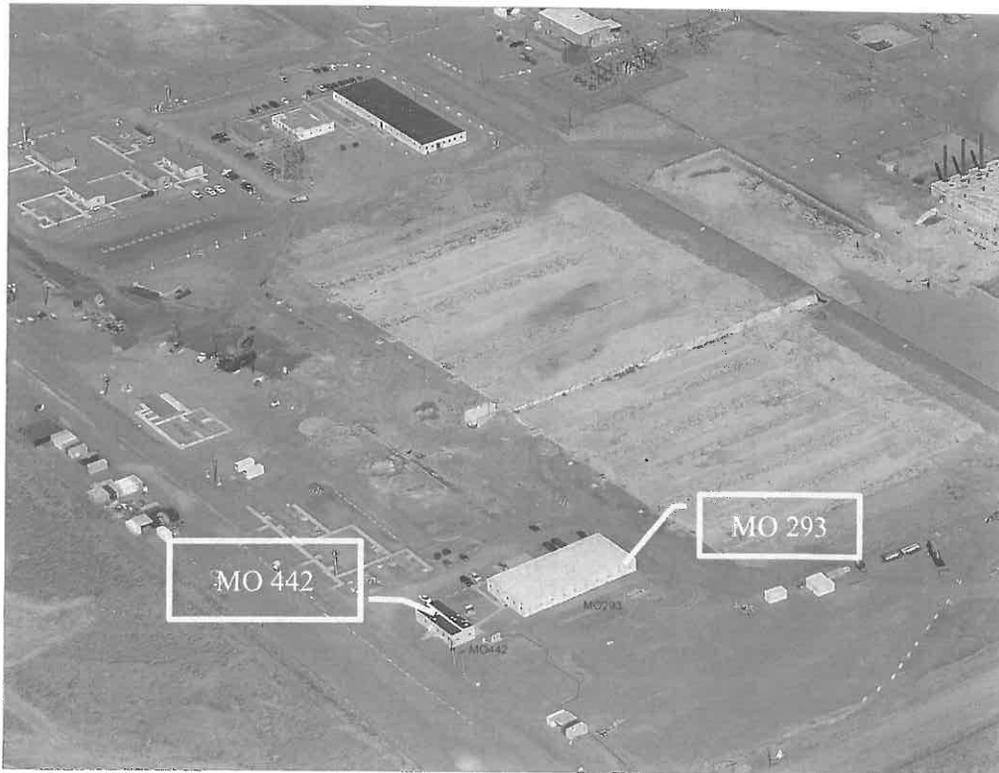


Figure 2. MO-293 and MO-442 Prior to Removal Action

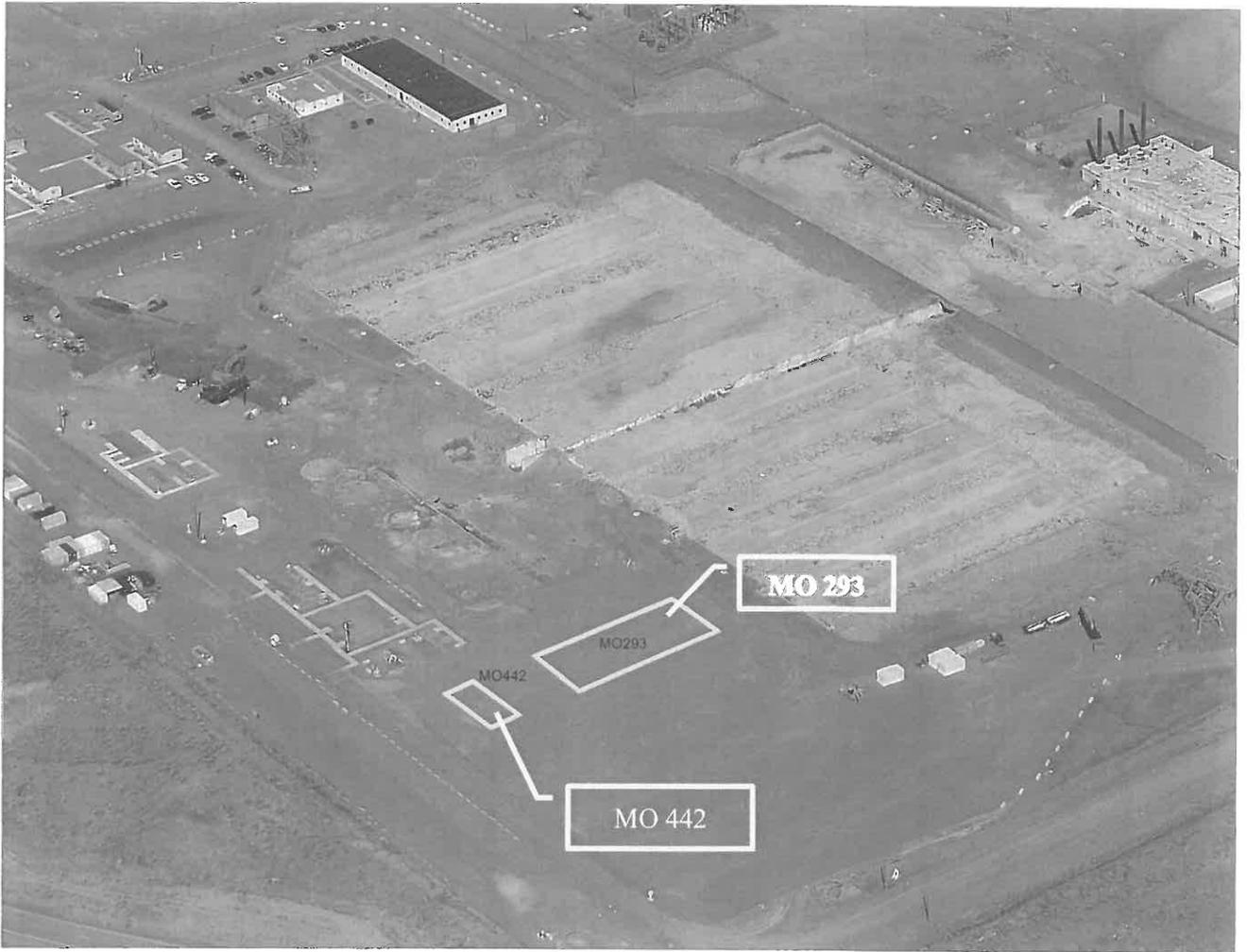


Figure 3. MO-293 and MO-442 Areas After Removal Action



Figure 4- Last Section of MO-293 Leaving 100 K

3.2 Verification Activities

Visual inspections and radiological surveys performed during the D4 of the mobile offices provided no evidence of subsurface soil impacts from radiological or other hazardous materials. No verification sampling was conducted as part of this removal action. Surveys for beryllium and asbestos were completed prior to disposal.

3.2.1 Radiological Surveys

These mobile offices were not used for or in support of radiological work activities. However, radiological surveys were performed to confirm radiological contamination was not present as a result of transport from biological vectors. In addition, radiological surveys were performed to support waste disposal activities. The radiological surveys conducted found some contamination as a result of biological vectors, which was bagged and removed prior to demolition. A copy of these surveys is provided in Appendix A.

3.2.2 Sampling and Analysis

Sampling and analysis were not required for this action other than as described in Table A above..

4 Performance Standards and Quality Control

4.1 Attainment of Performance Standards

4.1.1 Performance Completion Criteria

The following performance criteria are defined in the RAWP (DOE/RL-2006-26):

The Above-Grade (as a general rule, “grade” is the top of the main foundation) portion of the demolition is considered complete when the above-grade portions of the building(s) are removed to grade or slab on grade. Also, all waste generated during deactivation and demolition must be dispositioned.

The Below-Grade structures portion of the demolition is considered complete after all waste debris has been removed to a minimum of 0.9 meter (3 feet) below the surrounding grade, and the remaining portion will either be removed or left in place, depending on whether cleanup standards can be achieved. ...The decision to leave below-grade structures shall be made on a case-by-case basis and requires the concurrence of the EPA. At completion of the removal action, sites will be stabilized in a manner that allows for future remediation or closed in accordance with the soil cleanup values established in the appropriate ROD.

These 2 trailers were driven to ERDF on their wheels, so there were no below grade structures to address.

Table 1 presents the completion criteria developed from the approved RAWP (DOE/RL-2005-26) and a summary of the actions taken.

Table 1. Completion Criteria for the 100-K Area Mobile Offices Demolition

Phase of the Demolition Activities	Completion Criteria*	Criteria Complete?	Description of How the Completion Criteria Were Addressed
Above-Grade Structures	Remove interior portions of the building, including ACM, lead bricks, sheeting, PCBs (primarily in motor oils and light ballasts), mercury (primarily in light components and switches), and other hazardous materials for treatment, recycle, or disposal.	Yes	Pre-demolition planning identified the presence of mercury thermostats, refrigerants, lead batteries, oils and a tritium exit sign were characterized and disposed prior to or during demolition, as required. All waste was characterized and disposed in accordance with the Action Memorandum and the ERDF waste acceptance criteria.
	Above-grade portions of the facility(ies) will be removed or demolished to grade using standard demolition techniques (e.g., excavator with a hoe-ram, hydraulic shear with steal shear jaws, concrete pulverizer jaws or breaker jaws, crane with wrecking ball, and/or controlled explosives).	Yes	MO 293 & 442 were separated into their original manufactured sections, tires installed and towed to ERDF for disposal.

Table 1. Completion Criteria for the 100-K Area Mobile Offices Demolition

Phase of the Demolition Activities	Completion Criteria*	Criteria Complete?	Description of How the Completion Criteria Were Addressed
Below-Grade Structures	Below-grade structures, if present, will be removed to a minimum of 3ft. below surrounding grade, and the remaining portion will either be removed or left in place, depending on whether cleanup standards can be achieved.	N/A	No below-grade structures were associated with the mobile office trailers. However, a sanitary sewer holding tank associated with MO's-293 and 442 was pumped, and the tank left in place to be remediated under a separate CERCLA removal.
	Remediate contaminated soils within the footprint of the facilities or defer to a later remedial action (with approval from EPA).	N/A	Soil remediation will be deferred to a later date. As these trailers were rolled away on their wheels, there is no need to remove 3 feet of soil, nor to backfill with clean soil.
	Upon completion of demolition activities, a minimum of 3 ft of clean fill/soil cover will be placed over any remaining below-grade structure and inert material, and the fill will be graded to match the surrounding terrain.	N/A	No soil disturbance.
Waste Management	Conduct waste characterization prior to and during D4 activities in accordance with the data quality objectives process identified in the <i>100-K Area Interim Safe Storage and D4 Project Waste Sampling and Analysis Plan</i> (DOE/RL-2005-33). Characterization is conducted to support waste disposal activities, to define contaminants present before or after the completion of the removal action, and, in some cases, to support site closure documentation.	Yes	Waste characterization was performed in accordance with DOE/RL-2005-33 during D4 activities to guide waste removal and disposal.
	Manage and dispose of all waste (including general construction debris, ACM, lead bricks, sheeting, PCBs, mercury, and other hazardous materials) generated during the removal action. Waste generated will be characterized in accordance with the contractor's procedures, the requirements of the receiving facility, and the waste characterization sampling and analysis plan.	Yes	Pre-demolition planning identified the presence of mercury thermostats, lead batteries, and ACM that were characterized and disposed prior to or during demolition, as required. All wastes generated during the D4 activities were characterized, packaged, shipped, and disposed in accordance with waste management ARARs and the ERDF waste acceptance criteria.

Table 1. Completion Criteria for the 100-K Area Mobile Offices Demolition

Phase of the Demolition Activities	Completion Criteria*	Criteria Complete?	Description of How the Completion Criteria Were Addressed
Verification	After the removal activities are completed, the site must be characterized to document the condition following the removal of the facility and/or structure.	Yes	Radiological surveys and visual observations were conducted during D4 activities. No detectable radiological contamination or visual indications of nonradiological releases were found beneath the mobile offices. Field sampling and laboratory analysis were not required.
Documentation	DOE-RL will provide documentation describing the environmental conditions at the end of the D4 activity.	Yes	The post-D4 environmental conditions for the 2 mobile offices are presented in this report.

* Completion criteria were developed from the removal action requirements of DOE/RL-2005-26, *Removal Action Work Plan for 105-KE/105-KW Reactor Facilities and Ancillary Facilities*.

4.1.2 Removal Action Objectives Verification

Removal of the mobile offices achieved the following RAOs identified in Section 2.3.1:

- *Protect human receptors from exposure to contaminants above acceptable exposure levels within facility structures*

No radiological contaminants were identified during the course of this removal action.

Nonradiological UHCM (i.e., mercury thermostats, lead batteries, refrigerant, oils) were identified and appropriately disposed during D4 of the mobile offices. The physical removal and appropriate disposal of the 2 mobile offices eliminated the potential for human exposure to hazardous substances above acceptable levels.

- *Control the migration of contaminants from the facilities into the environment*

Pre-demolition planning and waste characterization activities identified the presence of nonradiological contaminants (i.e., mercury thermostats, lead batteries, refrigerant, oils) within the mobile offices. All wastes generated during the D4 activities were characterized, packaged, and disposed in accordance with the waste management ARARs and the ERDF waste acceptance criteria. The physical removal and appropriate management and disposal of the 2 mobile offices eliminated the potential for release of contaminants into the environment.

- *Facilitate and, to the extent practicable, be consistent with anticipated remedial actions within the 100-K Area OUs*

The physical removal and appropriate management and disposal of the 2 mobile offices are consistent with the selected remedy of Remove/Treat/Dispose from the 100 Area Remaining Sites ROD (EPA/ROD/R10-99/039).

- *Prevent adverse impacts to cultural resources and nesting migratory birds*

A cultural resources review was conducted for various demolition activities within a 183-acre area inside the fence line of the 100-K Area (encompassing the footprint of the mobile offices), which found no known archaeological sites located on the ground surface within this area. The mobile offices were identified as noncontributing/exempt to/from the historic district; therefore, the removal action at the mobile offices did not have an adverse impact to cultural resources.

A blanket biological review, which included the remaining mobile offices, was completed in December 2010 and covered scheduled demolitions of buildings inside the fenced boundary of the 100-K Area (#2010-100-116 “Biological Review of the Accelerated D&D of the 100K area”). The review indicated that the 100-K Area was a highly disturbed industrial area with no native vegetation present. D4 activities occurred outside of the nesting season. No migratory bird species were observed or nesting in the vicinity of any of the mobile offices during the D4 activities. Therefore, there was no adverse impact to migratory birds as a result of this removal action.

- *Achieve ARARs to the fullest extent practicable*

The ARARs presented in the Action Memorandum (EPA, 2007) and RAWP (DOE/RL-2005-26) included waste management standards, air emission control standards, protection of cultural and natural resources, and worker safety and health standards. This removal action was completed in general accordance with these ARARs.

- *Safely treat, as appropriate, and dispose of waste streams generated by the removal action*

Waste streams generated by this removal action were managed in accordance with the ARARs and treated, as appropriate, to meet the ERDF waste acceptance criteria for disposal. This removal action included the safe physical removal and disposal of the mobile offices into the ERDF.

- *Take no action that will preclude the eventual final disposition of the 105-KE and 105-KW Reactor blocks*

Completion of this removal action provided better access for the remediation of waste sites near the 105-KE and 105-KW Reactors, and does not preclude the eventual disposition of the 105-KE or 105-KW Reactor blocks.

4.1.3 Statement of Protectiveness

This removal action mitigates the threat of release of contaminants to the environment, and is consistent with interim remedial actions for the 100-KR-2 OU. Protection of human health and the environment has been demonstrated by the removal of the 2 mobile offices and the determination that no detectable radiological contamination or other potentially hazardous substances remain.

4.2 Construction Quality Assurance/Quality Control

The trailers were established as “Cold and Dark” with all power and utilities removed by K Area crews.

4.3 Cleanup Verification Quality Assurance/Quality Control

Not applicable. Sampling and analysis were not required for this action. No stains were present on soil surfaces beneath either trailer.

4.3.1 Data Quality Assessment

Not applicable. Sampling and analysis were not used to demonstrate protectiveness for the footprint of the 2 mobile offices.

4.3.2 Environmental Quality Assurance

Field instrumentation, calibration, and quality assurance checks were performed in accordance with the following procedures:

- Calibration of radiological field instruments on the Hanford Site is performed under contract by Mission Support Alliance (MSA)
- Daily calibration checks are performed and documented for each instrument used for conducting surveys. The calibration checks are made using direct comparison to standard materials that are sufficiently similar to the matrix under consideration and/or certified radioactive sealed sources.

The approval of field data by the radiological controls organization provides the data validation and usability review for handheld field radiological measurements.

4.4 Regulatory Oversight

EPA is the lead regulatory agency for this removal action, and provided the necessary oversight.

5 Final Inspection and Certifications

No final inspections or certifications other than those required by section 4.1 are applicable to or required by the removal action for the mobile offices.

6 Operation and Maintenance Activities

Operations and maintenance activities are not applicable.

7 Summary of Project Costs

Table 2 provides a summary of project costs. The D4 activities for MO-293 and MO-442 were Base-funded.

Table 2. Cost Summary

Facility Name	Final Total Cost (Burdened)
MO-293 and MO-442	\$204,600

8 Observations and Lessons Learned

The D4 remediation group performed this work by subcontracting it to MSA. The crafts that performed the work had completed similar work at PFP. The removal of these two trailers was well executed with enough time allocated between sampling to obtain sample results without delaying trailer removal.

9 Contact Information

DOE Contractor:	CH2M HILL Plateau Remediation Company
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